UKRAINE MANUAL PRODUCT I.C

Guidelines for Allocating Oblast Health Budgets Among Rayons and Cities

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1.0 OBJECTIVES

The purpose of this manual is to provide practical guidance to the staff of an oblast health administration in establishing decentralized global budgets for: 1) oblasts; and 2) rayons and cities. In this context, a global budget is an aggregate payment to an oblast, rayon or city health administration fixed in advance to cover selected health service expenditures over a specified period of time. This manual is not designed to be prescriptive, i.e., it does not promote any particular approach to resource allocation over another. Instead, it attempts to provide practical guidelines in the use of each method, including identifying its strengths, weaknesses, and data requirements. A set of tips for implementation is also provided for each method.

The manual has two target audiences, each with somewhat different needs. The first target audience includes oblast health administrators, who will want to focus on the description of each method, the discussion of its strengths and weaknesses, and the tips for implementation. The second target audience is the oblast health administration economists and statisticians who will actually make the calculations necessary to allocate budgets. They will be most interested in the description of each method, the example of its use, and the description of the data necessary to implement the method. In order to meet the needs of both target audiences, the manual clearly distinguishes between each of the above topics in the discussion of each method.

2.0 BACKGROUND AND CONTEXT

This manual is based on earlier work done by the Zdrav*Reform* Program in L'viv Oblast. A two-person project team visited L'viv Oblast in July 1995 to evaluate existing and proposed systems of allocating the oblast budget between rayons and cities. The team consulted with officials of the oblast and city health departments and presented a seminar to a conference of oblast physicians. The consultants prepared a report which evaluated the effects of the recent system for allocating resources as well as the proposed per capita allocation system.[1] A number of the recommendations made in this report are under consideration for the per capita budgeting system which is proposed for L'viv Oblast. This manual is based on the earlier work of this Zdrav*Reform* consultant team.

3.0 POLICY ISSUES

3.1 Importance of Methods

The allocation of budgets between geographical entities is an important problem for three reasons. First, the allocation of resources is in general one of the most important expressions of policy priorities in any organization, public or private. Perhaps more even than public statements, the allocation of resources provides a clear indication of what a government's actual priorities are. Second, the allocation of funds between geographical entities—for example, between oblasts at the

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[1] Robin Barlow and James Knowles, "An Assessment of Plans to Implement Per Capita Financing in the Health System of L'viv Oblast," Technical Report No. UKR-5, Zdrav*Reform* Program, Abt Associates Inc., Bethesda, MD (August 16, 1995).

national level, or between rayons and cities at the oblast level—is a highly charged political decision. Geographical units which do not get their "fair share" will tend to complain vigorously, sometimes challenging the very legitimacy of the higher-level administrative unit responsible for making the allocations. Third, the method by which global budgets are allocated to providers may either promote or discourage efficiency in the provision of health services at the rayon or city level.

The first step in setting up decentralized budgets for oblasts and rayons is to determine the level of budget allocated to each geo-political region. The second step is to establish a mechanism for allocating these funds from regional budgets to individual health care facilities or providers. This manual focuses on the first step concerning decentralization of budgets for rayons and oblasts and explains alternative formulas for calculating global budgets, but it also gives a brief overview of choices to be considered in the second stage of budget allocation to emphasize the importance of thinking through and implementing this next step.

Ideally, these global budget formulas would be used to allocate both operating and investment budgets. The reality is that decentralizing budgets will probably begin with allocating operating budgets, and the examples given here use data on operational budgets from L'viv oblast. This means that some adjustments to these formulas will likely be required to account for differences in health system infrastructure across oblasts and rayons. For example, in awarding the same per capita budget or age-sex weighted amounts to two areas with very different mixes of facilities to operate (e.g. one heavily hospitalized, the other less so), the formula allocation might be unfair.

3.2 First Step: Global Budgets for Rayons and Oblasts

One of the primary objectives in shifting to per capita budgeting is to provide greater incentives for efficiency. Global budgets provide a mechanism to control the level of expenditures and at the same time allow flexibility in use of resources within budget limits. This budget method also provides a relatively easy transition from line-item budgeting to a more complex budget system that stimulates improvements in efficiency and quality of care. It encourages stability in planning since once the formulas are in place, the budget levels are quite predictable from year to year. However, policy makers should be cautioned that there are disadvantages to global budgeting unless appropriate safeguards are put in place. Inadequate public budgets, unless complemented by other sources of funds, may limit access to care and lead to rationing health care. Without performance or quality of care monitoring systems, quality of care may suffer. Finally, global budgets create artificial levels of health care spending based on formulas rather than on market forces that equilibrate the supply of and demand for health care. Policy makers need to determine what health care services should be funded by state budgets and what health services could be provided through a competitive market system.

The success of global budgeting, in terms of achieving gains in efficiency while maintaining acceptable quality of care, depends on the following conditions:

- oblasts and rayons should be given substantial management autonomy in how they use resources;
- health administration units should develop strong management capabilities commensurate with new levels of management responsibility;
- quality assurance mechanisms should be put in place;
- formal mechanisms to adjust global budgets should be established to deal with unexpected changes in health care needs or utilization that merit adjustments in budget levels;
- patient choice of providers should be preserved to stimulate providers to maintain quality and efficiency of care;
- performance and productivity monitoring mechanisms should be developed and implemented;
- careful consideration should be given to selecting those services that should be financed by public budgets and leaving the remaining services to be funded and provided through other market mechanisms.

3.3   Second Step: Provider Payment Methods

The potential efficiency gains from using per capita global budgeting for an oblast or rayon can be either reinforced or weakened by the corresponding methods used to allocate these budgets to individual facilities. A variety of methods exist for paying providers from the oblast or rayon global budget. These are briefly defined here, but the reader is referred to other more extensive Zdrav*Reform* publications that describe these payment methods in more detail. [2]

- *Global budgeting*: An aggregate payment fixed in advance to cover expenditures of health facilities over a specified period of time.
- *Capitation*: A fixed amount paid per enrollee or member of a population to cover the costs of a defined package of services for a specified period of time.
- *Case-based payment*: Fixed payment covering all services for a specified case or episode of illness.
- *Fee-for-service*: Payment is made for each specific service rendered.

Each of these provider payment methods differs in terms of (1) the amount of financial risk that is shared between the provider, the patient, and the fundholder; (2) the complexity of information systems required to support documentation of payment amounts; (3) the need for utilization management; (4) the incentives to create more integrated delivery systems; and (5) the freedom of patients to choose to take responsibility for their own health, both financially and in types of health care sought. Each payment method has its own advantages and disadvantages and each society must carefully consider the tradeoffs it is willing to accept.

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[2] Alternative Payment Methods: A One Week Workshop. Zdrav*Reform* Project, Abt Associates Inc. July 7, 1995.

To summarize, establishing global budgets for oblasts and rayons is only the first step towards improving the quality and efficiency of government health services. The full gains in quality and efficiency desired by introducing decentralized global budgets for rayons and oblasts will only be realized if policy makers carefully select provider payment methods that reinforce these gains. If old budget allocation formulas to providers based on number of beds, bed-days or outpatient visits persist, the advantage of decentralized global government budgets will be lost.

4.0   REVIEW OF ALTERNATIVE METHODS

Governments have generally learned from experience that allocating budgets between lower-level geographical units—for example, between states in a federation, or between provinces and districts in a non-federal state—is more generally accepted by all parties when the system used is: 1) perceived to be "fair" in the sense of taking into consideration the most important factors which determine resource needs, and 2) based on a set of clearly understood formal procedures, or rules. In contrast, budget allocations made on the basis of "personal judgment" are almost always perceived by the losers as reflecting the personal or political preferences of the person or persons making the allocation.

This section of the manual describes six alternative procedures for allocating a global oblast health budget between: 1) oblast-level facilities, and 2) rayons and cities. The methods are presented in descending order of simplicity (i.e., from the simplest to the more complex). The order in which they are presented is not intended to reflect a preference for one method over another. In fact, it is often appropriate to combine two or more alternative allocation methods into a given formula. Most of the methods described below are practical and easy to employ using data which are already available to oblast health administrations. Specific examples are provided using actual data, in most cases, from L'viv Oblast. An additional three very simple methods are discussed in a technical appendix so that readers have a comprehensive list of formulas that can be used. Only those most relevant to the NIS countries are presented in the main text.

4.1   Allocation Based on Population

4.1.1   Description of Method

Each rayon or city receives a share of the total oblast health budget equal to its share of the oblast's population. This method of budget allocation is often referred to as "per capita" budgeting.

4.1.2   An Example

Table 1 provides the 1994 population of each rayon and city in L'viv Oblast (in an actual application, one should use 1993 population data, if available; however, population distributions change fairly slowly, so that population data for a recent year are also acceptable). These data would be used as follows to calculate Brody Rayon's 1993 budget:

Step 1:   Calculate Brody Rayon's share of the oblast's total population:

Brody Rayon's population / total oblast population = 67,399 / 2,705,286 = 0.0249 (or 2.49 percent).

Step 2:   Calculate Brody Rayon's 1993 health budget by multiplying the total 1993 oblast health budget by Brody Rayon's share of the oblast population:

Brody Rayon's 1993 health budget = 0.0249 x 157,736 = 3,928 million kupons (compared to its actual 1993 expenditures of 5,195 million kupons).

4.1.3   Data Requirements

The following data are needed to apply this method: 1) the population of each rayon and city in the current year (or for as recent a year as is available); and 2) the size of the total oblast health budget for the current year.

4.1.4   Strengths and Weaknesses

The major advantages of allocating health budgets on the basis of population are that: 1) it is generally perceived to be fair (everyone is treated equally); and 2) the method does not distort the incentives facing health managers to provide services efficiently (as is the case with allocations determined on the basis of the number of hospital beds or hospital occupancy rates).

One common weakness of allocations based on population is that the population actually served by the facilities located in a rayon or city may not coincide with the population residing within the rayon's or city's administrative boundaries. This problem, and a possible method for dealing with it, is discussed below.

Another important limitation of population-based allocations is that it is often difficult to obtain recent and reliable estimates of population for small areas, such as rayons and cities. Reliable local-area population data are generally obtained from population censuses, which are typically conducted only once in ten years. Estimates of local area populations for inter-censal years are usually based on administrative records. In Ukraine, there is general agreement that the registration system is reasonably accurate in recording births and deaths. However, it is also readily acknowledged that the registration system is weak in recording migration, particularly between rayons and cities in a given oblast. Since most of the variation in population growth rates between local areas in Ukraine is due to variations in migration rates (since fertility and mortality are uniformly low), the local area population estimates are of questionable accuracy. Under these conditions, one can expect the "losers" in a per capita budget allocation to assert that their population is "seriously undercounted." The population-based formula also does not address differences in health care needs by age-sex groups, epidemiological patterns, or variations in health infrastructure. Some of these problems are resolved by methods discussed next.

4.2   Allocation Based on Population Adjusted for Age and Sex

4.2.1   Description of Method

The budget of a rayon or city is determined on the basis of its share of the total oblast population, with the population share of each rayon or city adjusted to reflect its age-sex distribution.   The age-sex adjustments are made to reflect differential use of health services according to age and sex.

4.2.2   An Example

Table 2 provides data on the age-sex distributions (i.e., the proportions of the total population in each age-sex group) of both the total population of L'viv Oblast and the population of Brody Rayon. In addition, Table 2 provides an illustrative set of coefficients indicating *relative* use of health services by each age-sex group. Using this method, these data would be used to calculate Brody Rayon's 1993 health budget as follows:

Step 1:   The age-sex health service utilization coefficients are multiplied by the corresponding proportions of the population in each age-sex group in Brody Rayon and summed to obtain an age-sex-weighted utilization rate for Brody Rayon (the numbers used in this calculation, which are obtained from Table 2, are given below only for the first three male and female age groups):

Age-sex-weighted utilization rate for Brody Rayon = 9.0 x 0.0356 + 3.7 x 0.0422 + 3.0 x 0.0373 + ... remaining male age groups ... + 4.5 x 0.0341 + 3.0 x 0.0384 + 2.5 x 0.0383 ... + remaining female age groups = 5.3401.

Step 2:   A similar calculation is done for L'viv Oblast, i.e., the same age-sex health service utilization coefficients are multiplied by the corresponding proportion of the population in each age-sex group in L'viv Oblast and summed to obtain an age-sex-weighted utilization rate for L'viv Oblast (the numbers used in this calculation, which are also obtained from Table 2, are given below only for the first three male and female age groups):

Age-sex-weighted utilization rate for L'viv Oblast = 9.0 x 0.0353 + 3.7 x 0.0402 + 3.0 x 0.0382 + ... remaining male age groups ... + 4.5 x 0.0335 + 3.0 x 0.0387 + 2.5 x 0.0370 ... + remaining female age groups = 4.9376.

Step 3:   An age-sex distribution adjustment factor is obtained for Brody Rayon by dividing its age-sex-weighted utilization rate by that for L'viv Oblast:

Brody Rayon's age-sex distribution adjustment factor = 5.3401 / 4.9376 = 1.0815.

(For purposes of comparison, L'viv City's age-sex distribution adjustment factor is 0.9225.)

Step 4:   Brody Rayon's share of the total oblast population (0.0249, as calculated above) is multiplied by its age-sex distribution adjustment factor to obtain its age-sex-weighted share of the oblast population:

Brody Rayon's age-sex-weighted share of the oblast's total population = 0.0249 x 1.0815 = 0.0269.

(For purposes of comparison, L'viv City's age-sex-weighted share of the oblast's total population is 0.2660, compared to its unweighted share of 0.2883.)

Step 5:   Brody Rayon's 1993 health budget is obtained by multiplying its age-sex-weighted share of the oblast's total population by the 1993 total oblast health budget:

Brody Rayon's 1993 health budget = 0.0269 x 157,736 = 4,243 million kupons (compared to its unweighted per capita level of 3,928 million kupons and Brody Rayon's actual 1993 health budget of 5,195 million kupons).

4.2.3   Data Requirements

The data requirements for this method are: 1) population by 5-year age group and by sex for each of the rayons and cities in the oblast; 2) a set of age-sex-specific relative health service utilization rates; and 3) the size of the current oblast health budget. As noted above, the population data do not have to be for the current or preceding year, but they should be for a recent year (e.g., within the past five years). The data on the age-sex distribution of the population can be for a different year from that of the total population, though it is preferable that they be the same.

The age-sex-specific relative health service utilization rates should refer to the basic package of health services which the government has agreed to support (since this is what the funds allocated are intended to pay for). Age-sex-specific relative health services utilization rates can be obtained as follows:

Step 1:   Calculate annual utilization rates by age and sex for each type of service included in the basic package. Possible examples might be: 1) the mean number of normal obstetric deliveries annually per person in the population by age and sex (which would be zero for everyone except females ages 15-19, 20-24, 25-29, ..., 40-44, 45-49); 2) the mean number of immunizations received annually per person by age and sex (which would be highest for ages 0-5 but which would be non-zero for other age groups as well); or 3) the mean number of tuberculosis patients treated annually per person by age and sex. Illustrative examples of these utilization rates would be 0.13 normal obstetric deliveries annually for a woman age 25-29 or 1.77 immunizations per year for children ages 0-5. The data needed to calculate these rates would be

obtained from published statistics in some cases or from a random sample of hospital and clinic records from the oblast (assuming that information on the age and sex of patients is included in these records) together with data on the population by age and sex of the oblast.

Step 2:   Weight the various services according to an estimate of their relative cost. The cost estimates themselves can be based on facility-level estimates of the cost of the individual services, or, pending the availability of such cost estimates, they can be based on relative value scales from another country, such as the U.S..[3] For example, if the cost of a normal obstetric delivery is used as the base value (or numeraire) for the relative cost weights (i.e., its weight is 1.000), the relative cost weight for an immunization might be 0.013, whereas that for treating a tuberculosis patient might be 4.567.

Step 3:   Multiply the service utilization rates for each age and sex group by the relative cost weights and sum them to obtain an estimate of the relative cost-weighted service utilization rates for each age and sex group. This process would yield a set of age-sex-specific weights similar to those reported in Table 2.

4.2.4   Strengths and Weaknesses

Since health service utilization differs substantially by age and sex, the main strength of this method is that the budget allocation is based on a more valid indicator of need as compared to the unweighted population.

There are three primary weaknesses of the method. First, as noted above, administratively based population estimates for local areas may not be very reliable. Any errors are likely to be magnified with respect to the age-sex distribution of the population. Second, the age-sex utilization rates need to accurately reflect the utilization of *services actually provided* by the oblast health facilities, and this information is not yet readily available. Age-sex-specific utilization rates similar to those presented in Table 2 (i.e., the 1989 Moscow age-sex adjusters developed by Semashko Institute of Public Health and Social Hygiene) are currently being used in Ukraine and other countries of the former Soviet Union (e.g., Kyrgyzstan) but may no longer be appropriate to the current health system in Ukraine. These formulas lock into the budget the utilization patterns and medical practices of the time the weights were calculated unless the weights are periodically updated. Third, as with the per capita budget formula, the epidemiological or environmental conditions are still not addressed.

4.2.5   Tips for Implementation

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[3] In health systems with a functioning private sector, the estimates of relative cost can also be based on relative prices.

For best results, the age-sex-specific utilization rates should be modified to reflect the age-sex-specific utilization of the *basic package* of health services which is to be provided with public funds.

4.3   Allocation Based on Rural Population

4.3.1   Description of Method

A rayon or city health budget is determined in part on the basis of its share of the oblast's rural population. Rural health services are likely to cost more on a per capita basis than urban services because it is more difficult to deliver these services to a widely scattered population. The effect of this procedure is to weight the rural population more heavily than the urban population.

4.3.2   An Example

Assuming (for purely illustrative purposes; see discussion below in section 4.3.5) that 70 percent of the L'viv Oblast health budget is to be allocated on the basis of the rayon's or city's share of the total oblast population, with the remaining 30 percent allocated on the basis of the rayon's or city's share of the oblast's rural population, the calculation of Brody Rayon's 1993 health budget would proceed as follows:

Step 1:   Calculate 70 percent of the total oblast health budget to be allocated on the basis of Brody Rayon's share of the total population:

Amount of oblast health budget to be allocated on a per capita basis = 0.70 x 157,736 = 110,415.

Step 2:   Calculate the remaining 30 percent of the oblast health budget to be allocated on the basis of Brody Rayon's share of the oblast's rural population:

Amount of oblast health budget to be allocated on the basis of the rural population = 0.30 x 157,736 = 47,321.

Step 3:   Use data in Table 1 to calculate Brody Rayon's share of the oblast's rural population:

Brody Rayon's share of the oblast's rural population = 64,636 / 1,098,043 = 0.0589.

Step 4:   Calculate Brody Rayon's 1993 budget as the sum of: 1) the product of 70 percent of the oblast's health budget with Brody Rayon's share of the total oblast population (0.0249, as obtained above); and 2) the product of the remaining 30 percent of the oblast health budget with Brody Rayon's share of the oblast's rural population:

Brody Rayon's 1993 health budget = 0.0249 x 110,415 + 0.0589 x 47,321 = 5,536 million kupons (compared to its per capita allocation of 3,928 million kupons and actual 1993 health expenditures of 5,195 million kupons).

(For purposes of comparison, with this method and the same assumptions L'viv City's health budget would be only 70 percent as large as with a straight per capita allocation.)

4.3.3 Data Requirements

This budget allocation method requires the following data: 1) the total and rural populations of each rayon and city; 2) the share of the total health budget to be allocated on the basis of the rural population (e.g., 30 percent, in the above example); and 3) the size of the current year's total oblast health budget.

4.3.4 Strengths and Weaknesses

The main strength of this method is that it provides a simple way to adjust budget allocations for the higher unit costs of providing health services to more widely scattered rural populations. One of the reasons unit costs are higher for rural populations is that economies of scale cannot be as easily exploited in providing health services to rural populations.

The main weakness of this method is that it is difficult to fix the share of the total budget which should be allocated on the basis of the rural population. In principle, the size of this share should depend on the assumed differential between unit hospital costs for urban and rural populations (see discussion below).

4.3.5 Tips for Implementation

In the case of L'viv Oblast, with 40.59 percent of its total population rural, allocating 30 percent of the total budget on the basis of each rayon's and city's share of the oblast's rural population (as in the example above) means that an entirely rural rayon would receive a per capita budget more than twice as large as a purely urban city (i.e., one with zero rural population). Unless the unit cost of providing health services to rural populations is twice that of providing the same services to urban populations (which is unlikely) a smaller proportion of the budget should be used (e.g., 10 percent).[4] Estimating the percentage for rural populations might begin by estimating by what percent rural per capita costs are higher than urban per capita costs. For example, as an illustration, one might assume that rural costs are 50% higher than urban costs, such that rural areas receive a weight of 1.5, while urban areas receive a weight of 1.0. Percentage of the total budget going to rural and urban regions would be based on a weighted average of rural and urban population sizes.

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[4] If the same budgeting procedures were applied to only 10 percent of L'viv Oblast's health budget, a purely rural rayon would receive only 1.274 times the per capita allocation received by a purely urban city. The general formula for this ratio is $1 + (P / [(1-P) \times K])$, where P refers to the proportion of the budget allocated on the basis of the rural population and K refers to the proportion of the oblast's population which is rural. For example, in the case of L'viv Oblast, with $K = 0.4059$, allocating 30 percent of the budget on the basis of a city's or rayon's share of the rural population (i.e., $P = 0.30$, as in the example presented in the text) yields a ratio equal to $1 + [0.3 / (0.7 \times 0.4059)] = 1 + 1.056 = 2.056$.

4.4   Allocation Based on Health Status or Environmental Risk

4.4.1   Description of Method

Some portion of a rayon's and city's health budget is allocated on the basis of a measure of its relative health status or its relative exposure to an environmental health risk. Commonly used measures of health status include: 1) crude death rate; 2) infant mortality rate; 3) average life expectancy at birth;[5] or (4) a combined mortality-morbidity measure such as healthy years of life lost per thousand population.   Measures of environmental risk might include: 1) average temperature; 2) an index of pollution; or 3) rate of exposure to a risk such as radiation (e.g., Chernobyl).

4.4.2   An Example

We illustrate the method by assuming that 30 percent of the oblast health budget is allocated on the basis of each rayon's or city's crude death rate (CDR) relative to the oblast average. The calculation for Brody Rayon would proceed as follows:

Step 1:   Calculate Brody Rayon's relative CDR adjustment factor:

                Brody Rayon's relative CDR adjustment factor = Brody Rayon's CDR / L'viv Oblast's CDR = 15.40 / 11.33 = 1.359.

Step 2: Multiply Brody Rayon's share of the total oblast population (i.e., 0.0249, as derived above) to obtain its relative health status-weighted share of the population:

                Brody Rayon's relative health status-weighted share of the population = 1.359 x 0.0249 = 0.0338.

Step 3:   Calculate Brody Rayon's 1993 health budget as the sum of: 1) the product of Brody Rayon's unweighted share of the population (0.0249) and 70 percent of the 1993 oblast health budget (110,415 million kupons, as derived above); and 2) the product of Brody Rayon's relative health status-weighted share of the oblast population (0.0338) and the remaining 30 percent of the oblast health budget:

                Brody Rayon's 1993 health budget = 0.0249 x 110,415 + 0.0339 x 47,321 = 2,749 + 1,599 = 4,348 million kupons (compared to its per capita allocation of 3,928 million

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[5] If the measure of health status is positive (i.e., higher values correspond to better health status), the inverse of the measure (i.e., one divided by the measure) can be used in the calculations. For example, in the case of average life expectancy at birth, which is a positive measure of health status, the inverse of average life expectancy at birth (i.e., = 1 / LX , where LX is average life expectancy at birth) can be used and the calculations would proceed as with the crude death rate.

kupons and Brody Rayon's actual 1993 health expenditures of 5,195 million kupons).

Step 4:   Check to see that the sum of the individual rayon and city budget allocations is equal to the total budget. If it is not, proceed to Step 5.

Step 5:   (may not be necessary; see Step 4 and discussion below under "Data Requirements"). Divide the calculated budget of each rayon or city by the ratio of their sum to the total oblast budget.

4.4.3   Data Requirements

This budget allocation method requires the following input data: 1) the crude death rate for all rayons or cities (or another measure of health status or environmental risk); 2) the share of the budget which will be allocated on the basis of health status (30 percent in the above example); and 3) the size of the total oblast health budget in the current year.

4.4.4   Strengths and Weaknesses

The principal strength of this allocation method is that it may reflect relative need more accurately than the age-sex distribution of the population.

It has three main weaknesses. First, the proportion of the budget which is allocated using this method is arbitrary, as is the choice of specific measures of health status and environmental risk to employ. There is little "technical" guidance which can be provided to health system managers regarding the appropriate share of the oblast budget which should be allocated on the basis of measures of health status or environmental risk.[6] Second, when the measure of health status is at least partly under the control of the health system (as is the case with most measures of health status, e.g., the crude death rate, but which is not the case with most measures of environmental risk), the budgeting process will provide health managers with an incentive to maintain poor health status in order to increase their share of the oblast budget. Third, an additional weakness of health-status-based allocations is that the cost of health interventions is imperfectly correlated with health status measures. For example, poor health status indicators in a given area may be heavily determined by general factors such as the quality of drinking water, young age of mother at first birth, nutritional practices, female education, level of income, and abuse of alcohol and drugs, none of which can be addressed solely by health services. The presence of each of these factors might well mean more use of health services compared to regions where these factors are weaker, but probably not in proportion to the effects of these factors on life expectancy or healthy life-years foregone.

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[6] One way of dealing with this problem is to use the technique of multiple regression analysis to estimate the individual effects on health status of alternative measures of environmental risk. A discussion of how this technique might be used in Ukraine, and the problems likely to be encountered in doing so, is included in the original consultants' report referred to above.

4.4.5   Tips for Implementation

Because deaths are relatively rare events, crude death rates tend to fluctuate quite a bit from year to year at the rayon or city level without signifying any change in underlying health status or health risk. For this reason, it is a good idea to average the crude death rates for the past 2-5 years.

It is possible to combine two or more measures of health status and environmental risk into a single index of "disadvantaged health status." However, the weighting given to the individual components of the index will be arbitrary. In the absence of clear indications that one is more important than another, the various measures should probably be normalized (i.e., expressed as deviations from the oblast mean divided by the standard deviation) and simply summed to produce an index.   Once an appropriate index has been obtained, the calculations would proceed as described above.

There are two possible ways to deal with the negative incentives provided to health system managers when using measures of health status as a basis for allocating part of the oblast health budget. First, and by far the simplest solution, is to use only baseline information on crude death rates (i.e., do not revise the allocation based on crude death rates over time). Instead, to reflect the reasonable expectation that extra resources provided to rayons and cities with relatively high death rates will gradually reduce such differentials, the *share* of the budget allocated on the basis of relative crude death rates can be gradually diminished (for example, over a ten-year period). A second alternative is to base subsequent year allocations in part on relative *improvements* in the relative health status measures (e.g., decreases in the rayon's or city's crude death rate relative to the average decreases achieved by all rayons and cities in the oblast).

4.5   Allocation Based on Cross-boundary Patient Flows

4.5.1   Description of Method

Each rayon's or city's allocation reflects in part its share of the total patients in the oblast who received treatment in the facilities of other rayons and cities of the oblast. The idea is that if a rayon or city treats a disproportionately large share of patients crossing rayon or city boundaries to be treated, it should receive a higher budget allocation, or conversely, if a rayon or city does not treat a large share of its own residential patients, it should lose some of its budget allocation.

4.5.2   An Example

In the absence of real data on oblast patients receiving treatment in facilities outside their rayon or city of residence, the following illustrative example is used for Brody Rayon and L'viv City. Suppose that the rayon and city facilities in L'viv Oblast provide 210,000 inpatient stays and 3.5 million outpatient visits during 1992, of which 10,000 inpatient stays and 0.5 million outpatient visits are provided to residents of *other oblasts*. Further, we assume that 20,000 of the remaining inpatient stays and 500,000 of the remaining outpatient visits are provided to L'viv Oblast residents residing in rayons and cities other than the rayons or cities providing this care (i.e., cross-boundary

patients). Assuming that four outpatient visits are the equivalent of one inpatient day (an assumption frequently used in health economics research) and that the average length of an inpatient stay is 10 days, the proportion of total services provided by rayons and cities to residents of other rayons and cities is given by:

> Proportion of care provided to residents of other cities and rayons = (inpatient-day-equivalent services provided to residents of other rayons and cities) / (total inpatient-day-equivalent services provided by facilities of L'viv Oblast) = (10 x 20,000 + 500,000/4) / (10 x 200,000 + 3,000,000/4) = 325,000/2,750,000 = 11.82 percent of services.

Since 11.82 percent of services are provided to patients from other rayons and cities, we shall assume that 11.82 percent of the oblast budget is allocated to rayons and cities on the basis of the proportion of services to residents of these other rayons and cities which their facilities account for, and the rest of the budget (88.12 percent) is allocated on the basis of population (i.e., a straight per-capita basis). Further, we arbitrarily assume that facilities in Brody Rayon and L'viv City account respectively for 1.5 percent and 43.4 percent of cross-boundary services.[7] Under these assumptions, the calculations would proceed as follows:

Step 1:   Calculate 11.82 percent of L'viv Oblast's total 1993 health budget to be allocated on the basis of cross-boundary patients treated:

Portion of 1993 L'viv Oblast health budget to be allocated on the basis of cross-boundary patients treated = 0.1182 x 157,736 = 18,644 million kupons.

Step 2:   Calculate remaining portion of oblast health budget to be allocated on a per capita basis:

Portion of 1993 oblast health budget to be allocated on a per capita basis = 0.8818 x 157,736 = 139,092 million kupons.

Step 3:   Calculate Brody Rayon's 1993 health budget as the sum of: 1) the product of Brody Rayon's share of cross boundary patients treated (0.015, or 1.5 percent) and the portion of the oblast health budget to be allocated on the basis of cross-boundary patients treated (18,644 million kupons); and 2) the product of its share of the oblast's total population (0.0249, as calculated above) with the portion of the oblast health budget to be allocated on the basis of population (139,092 million kupons):

Brody Rayon's 1993 health budget = 0.015 x 18,644 + 0.0249 x 139,092 = 3,743 million kupons (compared to a straight per capita-allocated budget of 3,928 million

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[7] These numbers are arbitrary assumptions in the present example. However, the actual percentages would be obtained from data on the number of inpatient and outpatient services provided by each rayon or city according to the patient's rayon or city of residence (or according to whether the patient was a resident of the rayon or city providing the service).

kupons or to Brody Rayon's actual 1993 health expenditures of 5,195 million kupons).

(For purposes of comparison, a similar calculation for L'viv City yields a 1993 health budget of 48,192 million kupons, i.e., 0.434 x 18,644 + 0.2883 x 139,092 = 48,192 million kupons (as compared to a straight per capita budget of 41,958 million kupons, or to its actual 1993 expenditures of 49,476 million kupons).

4.5.3   Data Requirements

Use of this method requires: 1) data from the previous year on the number of inpatient and outpatient services provided in each rayon or city by the patient's rayon or city of residence (or by whether the patient was a resident of the city or rayon providing the care); 2) data on the average length of stay by rayon and city; 3) a conversion factor for converting outpatient visits to inpatient days; 4) data on the population of each rayon and city; and 5) the size of the current year's total oblast health budget.

4.5.4   Strengths and Weaknesses

The primary strength of this method is that it provides a simple way to adjust per capita allocations for services provided to residents of other rayons and cities. The alternative, which is administratively more complex, is a system of inter-facility payments for services provided to residents of other rayons or cities.

The method's primary weakness is the substantial amount of data required, including information on services provided by rayon or city of residence of the patient. Another weakness is that the method allocates part of the current year's budget based on a rayon or city's share of the *previous* year's services provided to non-residents of the rayon or city. As long as patterns of cross-boundary patient flows do not vary dramatically from year to year, this should not be a major problem in practice.[8]

4.5.5   Tips for Implementation

In the absence of actual data on patients treated by rayon or city of residence, a survey can be done in facilities on several randomly selected days during the year in which this information can be collected.

In the example above it was arbitrarily assumed that four outpatient visits are the equivalent in terms of resources consumed of one inpatient day. In actual practice, cost estimates for inpatient services and outpatient services should be used to estimate the appropriate conversion factor. As more and better data become available on costs related to specific services (or diagnostic categories

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[8]   Although a system of inter-facility payments would theoretically not have this same weakness, in practice such a system would almost certainly experience substantial delays as well.

of patients), and if data on patients receiving such services by rayon or city of residence become available, more refined conversion formulas can be used to calculate the share of cross-boundary services provided by each rayon or city. Such refinement is potentially important because the case mix of cross-boundary services may be quite different from the average.

4.6   Allocation Based on Use of Oblast-level Facilities

4.6.1   Description of Method

Rayon and city budgets would be allocated partially on the basis of their differential use of oblast-level facilities. The idea is that rayons and cities whose residents make relatively greater use of oblast-level facilities (presumably because they reside nearer to these facilities) should receive a smaller per capita budget allocation as compared to rayons and cities making relatively less use of such facilities. The share of the oblast-level budget allocated in this way should be equal to that portion of the cost of oblast-level facilities which can be linked to providing patient services (i.e., net of costs related to teaching and research). The proportion of oblast-level services consumed by each rayon's or city's residents is compared to its proportion of the oblast population. The amount by which the share exceeds (or is less than) the rayon's or city's population share (i.e., its differential use of oblast facilities) is multiplied by the assumed cost of such oblast-level services, with the result subtracted (or added to) each rayon's or city's budget. Using this method, the sum of the health budgets of all rayons and cities does not change; only the *distribution* between rayons and cities is affected by their differential use of oblast-level facilities.

4.6.2   An Example

The method is used to calculate the 1993 health budgets of Brody Rayon and L'viv City. In the absence of real data, it is assumed that the cost of providing patient services in oblast-level facilities is 75,000 million kupons and that the residents of Brody Rayon and L'viv City consume respectively 1.25 and 48.05 percent of these services (after converting the actual inpatient and outpatient services into inpatient-day-equivalent services, as discussed in connection with "Allocation Based on Cross-Boarder Patient Flows"). With the preceding assumptions, the calculation of Brody Rayon's and L'viv City's 1993 health budgets would proceed as follows:

Step 1:   Calculate the 1993 health budget for Brody Rayon using a per capita formula (or alternatively, using any of the formulas discussed above):

Brody Rayon's 1993 per capita-allocated budget = 0.0249 x 157,736 = 3,928 million kupons.

(L'viv City's 1993 per capita-allocated budget = 0.2883 x 157,736 = 41,958 million kupons.)

Step 2:   Calculate the difference between Brody Rayon's proportionate use of oblast-level facilities and its share of the total oblast population:

Brody Rayon's differential use of oblast-level facilities = Brody Rayon's proportion of oblast-level services consumed - Brody Rayon's proportion of the oblast population = 0.0125 - 0.0249 = - 0.0124.

(The corresponding calculation for L'viv City is 0.4805 - 0.2660 = 0.2145.)

Step 3: Calculate Brody Rayon's budget adjustment to reflect its relative use of oblast-level services:

Brody Rayon's budget adjustment to reflect its relative use of oblast-level services = Brody Rayon's differential use of oblast-level services x the total cost of patient-related services in oblast-level facilities = - 0.0124 x 75,000 million kupons = - 930 (note that this is negative, due to Brody Rayon's relative under use of oblast-level health facilities).

(The corresponding calculation for L'viv City is 0.2145 x 75,000 million kupons = 16,088 million kupons.)

Step 4: Subtract Brody Rayon's charge for above-average use of oblast-level health facilities from its per capita-allocated budget:

Brody Rayon's 1993 health budget = 1993 per capita-allocated budget - charge for above-average use of oblast-level health facilities = 3,928 - (- 900) = 3,928 + 900 = 4,828 million kupons (i.e., its budget is increased relative to a straight per capita allocation).

(The corresponding calculation for L'viv City, based on our purely hypothetical assumptions, is: 41,958 - 16,088 = 25,870 million kupons, which is a substantial reduction compared to its straight per capita allocation.)

Note that if the budgets of all the rayons and cities were adjusted in the same way, the amounts added to some rayon and city budgets would exactly cancel the amounts subtracted from other rayon and city budgets (i.e., since the proportions of oblast-level service use and population both sum to one, their difference sums to zero). Therefore, the total oblast health budget allocated to rayons and cities would remain unchanged.

4.6.3   Data Requirements

This method requires the following types of data: 1) data on use of oblast-level facilities by rayon and city of residence; 2) a conversion factor for converting outpatient to inpatient services; 3) an estimate of the total cost of providing patient services in oblast-level facilities; 4) data needed to make basic per capita or alternative allocation (as described above); and 5) the size of the current total oblast health budget.

4.6.4 Strengths and Weaknesses

The primary strength of this method is that it provides a way to adjust rayon and city budgets for the differential access to and use of oblast-level health facilities by their residents. Since people living near to such facilities tend to make greater use of them, it is reasonable to assume that they need less funding for rayon- or city-level facilities. Another important strength of this method is that it provides an incentive to rayon and city health system managers to treat as many patients as possible in the rayon and city facilities, instead of referring them to oblast-level facilities. In a per capita allocation system, such an incentive could be very helpful.

The principal weakness of this method is its data requirements, which include information on use of oblast-level facilities by rayon and city of residence and an estimate of the cost of providing patient services in oblast-level facilities.

4.6.5 Tips for Implementation

Use of the method described above may result in greater adjustments than are desirable, due to the relatively high cost of oblast-level patient services. One modification to the method which may be preferred in practice is to adjust the budgets of rayons and cities for above-average use of oblast-level services on the basis of the unit cost of providing such services in rayon- or city-level facilities. In the context of our example above, if Brody Rayon's under-utilization of oblast-level services corresponded to 12,000 inpatient-day-equivalents, an amount equal to 12,000 multiplied by the unit cost of one inpatient day in a rayon-level facility would be added to Brody Rayon's basic health budget. Use of such a modified procedure would presumably yield more modest adjustments to rayon and city health budgets (but would not provide as strong an incentive to rayons and cities with a per capita system to treat patients in the rayon or city, rather than refer them to oblast-level facilities).

5.0 CONCLUSIONS

This manual has described a number of alternative methods of allocating oblast health budgets among rayons and cities. It begins with the simplest methods, some of which have been used in the past in Ukraine, and proceeds to describe more complex methods designed to promote greater equity and efficiency in the health system. Examples are also provided of allocations which use more than one type of formula for allocating budgets. There is no presumption made in the manual that one method or combination of methods is superior to another. Choice of budget allocation method in a particular application should depend on such considerations as: 1) overall health system objectives; 2) data availability; 3) political judgments; and 4) administrative feasibility.

It is also important to note that the potential efficiency gains associated with a given method of global budget allocation may be effectively nullified if not carried through and reinforced by correspondingly efficient methods of allocating budgets *within* rayons and cities between facilities.

For example, per capita budgeting at the oblast level in combination with traditional line-item budgeting at the facility level would provide no incentives for increased efficiency in the health system (although equity improvements might be registered in some cases).

	Table 1 Input Data					
Rayons/Cities	Population 1994	Rural Population 1994	Crude Death Rate 1992/93	Actual Health Expenditures 1992	Actual Health Expenditures 1993	Hospital Beds 1993
Brody	67,399	64,636	15.4	151	5,195	655
Busk	52,096	34,956	15.7	96	2,962	570
Gorodok	77,202	50,953	13.05	137	3,450	680
Drohobych	76,900	70,133	14.5	67	2,084	330
Zhydachiv	83,772	50,515	15.65	193	5,238	735
Zolochiv	77,357	47,497	15.55	141	4,360	870
Kamianka-Buska	61,600	37,822	13.6	104	2,737	535
Mykolaiv	95,500	45,744	9.9	256	8,162	500
Mostyska	62,552	46,351	14.85	98	2,557	1,642
Zhovkva	111,500	74,259	12.7	175	5,155	795
Peremyshlany	51,900	39,444	15.9	93	2,191	540
Pustomyty	112,000	95,872	12.05	104	2,861	605
Radehiv	53,801	40,781	15.15	80	2,818	450
Sambir	74,700	67,006	12.05	159	4,384	841
Skole	49,499	36,332	12.6	105	3,580	505
Sokal	98,700	62,082	13.4	160	4,478	785
Stary Sambir	85,800	65,723	14	139	4,002	780
Stryi	62,201	54,301	12.05	226	3,879	712
Turka	55,822	46,332	12.35	99	2,210	459
Yakoriv	123,490	67,302	10.05	214	6,401	1,050
L'viv	779,876	0	9.05	1,415	49,476	4,764
Boryslav	44,702	0	11.05	120	3,896	450
Drohobych	104,401	0	6.15	425	9,104	1,420
Sambir	43,497	0	12.05	93	2,575	494
Stryi	77,720	0	8.95	248	4,247	635
Truskavets	26,500	0	6.65	68	2,224	350
Chervonorad	94,799	0	7.55	247	7,512	1,152
OBLAST	2,705,286	1,098,043	11.33	5,415	157,736	23,304

Source: L'viv Oblast Health Administration

| | Coefficients of Relative Health Care Utilization | | Proportion of Population in Each Age-Sex Group | | | |
| | | | L'viv Oblast | | Brody Rayon | |
Age Groups	Male	Female	Male	Female	Male	Female
0-4	9	4.5	0.0353	0.0335	0.0356	0.0341
5-9	3.7	3	0.0402	0.0387	0.0422	0.0384
10-14	3	2.5	0.0382	0.0370	0.0373	0.0383
15-19	2.2	3	0.0375	0.0357	0.0350	0.0317
20-24	2.6	3.5	0.0403	0.0361	0.0278	0.0311
25-29	2	4	0.0376	0.0355	0.0256	0.0311
30-34	2	4	0.0419	0.0418	0.0395	0.0381
35-39	2.5	4.5	0.0375	0.0387	0.0350	0.0352
40-44	3.5	5	0.0301	0.0321	0.0284	0.0290
45-49	4.5	5.5	0.0258	0.0281	0.0242	0.0257
50-54	5	6.5	0.0242	0.0282	0.0228	0.0300
55-59	6.5	7	0.0262	0.0324	0.0266	0.0367
60-64	7.5	8.5	0.0245	0.0325	0.0290	0.0397
65-69	8	9.5	0.0169	0.0291	0.0201	0.0352
70 +	11	11.5	0.0198	0.0446	0.0283	0.0685

Table 2
Coefficients of Relative Health Care Utilization
and Population Age-Sex Distribution of L'viv Oblast and Brody Rayon

Source of Population Data: L'viv Oblast Health Administration

Source of Age-sex adjustment factors: Semashko Institute of Public Health and Social Hygiene. Moscow, 1989.

TECHNICAL APPENDIX:
THREE SIMPLE METHODS OF GLOBAL BUDGET ALLOCATION

A.1 Allocation Based on the Previous Year's Budget

A.1.1 Description of Method

The current year's budget is allocated to rayons and cities in the same proportions as in the preceding year. Equivalently, the budget of each rayon or city is increased (or decreased) by the same percentage as the total health budget increases (decreases) compared to the previous year.

A.1.2 An Example

Table 1 provides data on L'viv Oblast health expenditures by rayon and city for two years (1992 and 1993). Brody Rayon, for example, received 2.79 percent of the 1992 "budget" (151 million kupons).[9] Based on the 1992 budget allocation, it would receive the same share (2.79 percent) of the 1993 budget, or 4,401 million kupons. A step-by-step calculation proceeds as follows:

Step 1:   Calculate Brody Rayon's share of the preceding year's (1992) oblast health budget:

Brody Rayon's 1992 budget share = 151 / 5,415 = 0.0279 (or 2.79 percent)

Step 2:   Calculate Brody Rayon's 1993 budget by multiplying the 1993 oblast budget by Brody Rayon's 1992 budget share:

Brody Rayon's 1993 budget = 0.0279 x 157,736 = 4,401 million kupons (compared to its actual 1993 expenditures of 5,195 million kupons).

The same result could be obtained by first calculating the percent change in the oblast budget from 1992 to 1993:

Percent change in the oblast health budget 1992 to 1993 = 100 x (1993 budget - 1992 budget)/1992 budget = 100 x (157,736 - 5,415) / 5,415 = 2,813 percent

and then apply this same percentage change in the oblast budget to Brody's 1992 budget to determine Brody's 1993 budget:

Brody's 1993 budget = Brody's 1992 budget + Brody's 1992 budget x (percent change in the oblast budget/100) = 151 = 151 x (28.13) = 4,399 (the small

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[9] As a convenience, it is assumed throughout this manual that actual expenditures, which are provided in Table 1, are equal to budgeted expenditures. In practice, there is usually a significant difference between the two, especially in the presence of inflation.

difference between this result and the one reported above is due to rounding error in the calculations)

The same formula can be used whether there is an increase or a decrease in the oblast budget.

A.1.3 Data Requirements

This method requires: 1) data on the allocation of the oblast health budget in the preceding year; and 2) the size of the total oblast health budget in the current year.

A.1.4 Strengths and Weaknesses

The primary strength of this method is its simplicity; only budget data are needed. Another strength is that this method does not result in any abrupt changes in budget allocations from one year to the next.

The primary weakness in the method is that it maintains whatever flaws existed in previous budget allocations, and in some cases these may become magnified over time. For example, if some rayons and cities are gaining population rapidly while others are losing population, the budget allocation will not reflect these changes and the rapidly growing rayons and cities will soon be disadvantaged relative to the more slowly growing ones.

A.1.5 Tips for Implementation

This method is practical as a method to determine the budget of oblast-level facilities. In this case, the share of oblast-level facilities in the total oblast budget would remain constant over time.

A.2   Allocation Based on the Number of Hospital Beds

A.2.1 Description of Method

A rayon's or city's budget is the same proportion of the oblast health budget as the number of its hospital beds is in proportion to the total number of hospital beds in the oblast.

A refinement of the method is sometimes used in practice whereby different types of hospital beds are weighted differently to reflect the different complexity (and cost) of the services associated with them. In this case, norms may be used for budgeting in which each hospital bed of a given type is provided a certain amount of funding in the budget. The absolute level of funding corresponding to each norm is adjusted from year to year to reflect changes in the size of the oblast health budget (i.e., the relative sizes of the norms do not typically change from one year to the next). Although this method of budgeting is slightly different from the one described below (e.g., it requires current values of the norms for each type of hospital bed and data on numbers of each type

of bed as input data), it is subject to the same strengths and weaknesses as the simpler method described.

A.2.2   An Example

Table 1 provides data on the number of hospital beds in each rayon and city of L'viv Oblast in 1993. Using this method, Brody Rayon's 1993 budget would be determined as follows:

Step 1:	Calculate the number of hospital beds in Brody Rayon as a proportion of the total number of hospital beds in the oblast:

Brody Rayon's 1993 share of hospital beds = 655 / 23,304 = 0.0281 (or 2.81 percent).

Step 2:	Calculate Brody Rayon's 1993 budget by multiplying the 1993 oblast health budget by Brody Rayon's share of hospital beds:

Brody Rayon's 1993 budget = 0.0281 x 157,736 = 4,432 million kupons (compared to its actual 1993 expenditures of 5,195 million kupons).

A.2.3   Data Requirements

The data needed to use this method are: 1) the number of hospital beds in each rayon or city in the current year; and 2) the size of the total oblast health budget in the current year.

A.2.4   Strengths and Weaknesses

The primary strength of this method is that it allocates the oblast budget on the basis of the health infrastructure actually in place in each rayon or city. This lowers the likelihood that existing hospitals will be seriously underfunded in a given year.

The method's primary disadvantage is that it provides an incentive for each rayon or city to maintain as many hospital beds as possible in order to increase its budget. The objective of each health administrator should be to provide the maximum value of health services at the least cost possible consistent with quality standards. By providing budgets on the basis of the *inputs*, the health administrator loses the incentive to minimize costs, resulting in inefficiency. In practice, the method also requires rayons and cities to keep their hospital beds occupied, providing an additional incentive to skew the output of health services in the direction of more frequent and longer inpatient stays, thereby contributing to even greater inefficiency.

A.2.5   Tips for Implementation

This is the method (with certain refinements, as noted above) which has been most recently used to allocate health budgets in Ukraine. In a sense, this method does not resolve anything because it merely shifts pressures for greater budget allocations to pressures for authorization of additional hospital beds.

A.3   Allocation on the Basis of Equal Shares

A.3.1   Description of Method

Each city or rayon receives an equal share of the oblast health budget.

A.3.2   An Example

Since there are 27 rayons and cities in L'viv Oblast, Brody rayon (as well as all other rayons and cities) would receive a share of the total budget equal to 1/27, or 0.0370 (3.70 percent). This would give Brody rayon a 1993 budget of 5,836 million kupons (compared to its actual 1993 budget of 5,195 million kupons). However, L'viv City would receive the same amount, compared to its actual 1993 budget of 49,476 million kupons.

A.3.3   Data Requirements

The data necessary to use this method are: 1) the number of rayons and cities in the oblast; and 2) the size of the total oblast health budget in the current year.

A.3.4   Strengths and Weaknesses

One obvious advantage of this method is its simplicity. Another is that it is capable of reflecting fixed costs (e.g., the administrative costs of the rayon or city health administration) which may not vary much with the size of the rayon or city.

The primary weakness of the method is that it does not reflect the size of the rayon or city population to be served. In the case of L'viv Oblast, this problem would be most apparent in the allocation for L'viv City.

A.3.5   Tips for Implementation

Although this method is probably not well suited as a general method for allocating budgets, it is widely used as a basis for allocating some part of a budget (usually 10-30 percent) in order to reflect resource needs to meet fixed costs. For example, if it is estimated that approximately 10 percent of total rayon and city health costs are consumed by administrative and other services the magnitude of which do not vary with the size of the rayon, it would be sensible to allocate 10 percent of the global budget using this method.